A4. COLLECTION OF WATER SAMPLES

This chapter of the *National Field Manual* describes standard USGS methods (sampling strategies, techniques, requirements, and recommendations) for routine collection of representative water samples. A representative sample is one that typifies the ambient targeted characteristics of the media of interest at the time of collection. Obtaining representative samples is of primary importance for an accurate description of the environment. In order to collect a representative sample that will yield the information required, (1) study objectives, including data-quality requirements,[2] must be understood in the context of the water system to be sampled and (2) artifacts of the sampling process must be minimized.[3] Field personnel must be alert to conditions that could compromise the quality of a sample.

- **Think contamination!** To ensure the integrity of the sample, be aware of possible sources of contamination. Contamination introduced during each phase of sample collection (and processing) is additive and usually is substantially greater than contamination introduced elsewhere in the sample-handling and -analysis process. **Collect sufficient quality-control samples.**
- **Collect a representative sample.** Use appropriate procedures and quality-assurance measures that ensure sample representativeness and integrity and that meet study criteria.

[2]As used in this report, data-quality requirements refer to that subset of data-quality objectives pertaining to the analytical detection level for concentrations of target analytes and the variability allowable to fulfill the scientific objectives of the study.

[3]The degree to which a sample can be considered representative of a water body depends on many interrelated factors including, for example, temporal and spatial homogeneity of the water body, sample size, and the method and manner of sample collection.

Before field work begins, review the preparations for water sampling described in NFM 1 and the safety requirements described in NFM 9. Sampling plans should be prepared and reviewed in advance. Some programs require chain-of-custody documentation and (or) a prescribed format for sampling and safety plans (SAPs).

- **Never compromise the safety of field personnel.**
- **Become thoroughly familiar with sample processing requirements (NFM 5) before proceeding to collect water samples**.
- **Keep clear and precise field records.** Implement the methods described in this chapter conscientiously and consistently, as appropriate to study objectives and site conditions. **Any departure from standard methods needs to be documented, quality assured, and reported with the data and interpretation of the data.**

Sample collection forms a continuum with sample processing, and information in this chapter (such as collecting quality-control samples) overlaps to some extent with the information in NFM 5 for processing of water samples.